Complete Summary

GUIDELINE TITLE

Evaluation of patients for ventricular dysfunction and heart failure: HFSA 2006 comprehensive heart failure practice guideline.

BIBLIOGRAPHIC SOURCE(S)

Heart Failure Society of America. Evaluation of patients for ventricular dysfunction and heart failure. J Card Fail 2006 Feb;12(1):e16-25. [33 references] PubMed

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Heart Failure Society of America. Heart Failure Society of America (HFSA) practice guidelines. HFSA guidelines for management of patients with heart failure caused by left ventricular systolic dysfunction--pharmacological approaches. J Card Fail 1999 Dec;5(4):357-82.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

- Ventricular dysfunction
- Heart failure

GUIDELINE CATEGORY

Evaluation

CLINICAL SPECIALTY

Cardiology
Family Practice
Internal Medicine

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To provide recommendations for the evaluation of patients for ventricular dysfunction and heart failure

TARGET POPULATION

- Patients at risk of developing heart failure (HF)
- Patients suspected of having heart failure based on signs and symptoms or incidental evidence of abnormal cardiac structure or function
- Patients with established symptomatic heart failure

INTERVENTIONS AND PRACTICES CONSIDERED

1. Routine history
2. Physical examination
3. Chest x-ray
4. Electrocardiogram (ECG)
5. Echocardiography with Doppler
6. Evaluation of symptoms
7. Plasma B-type natriuretic peptide (BNP) or N-terminal (NT) pro-BNP concentration for patients suspected of having heart failure (HF) when the diagnosis is not certain
8. Differential diagnosis
9. Assessment of functional capacity/activity level assessed using New York Heart Association class or 6-minute walk test
10. Assessment of volume status
11. Standard laboratory tests
12. Follow-up assessments
13. Exercise testing, as indicated
14. Endomyocardial biopsy, as indicated
15. Re-evaluation of electrolytes and renal function
16. Repeat measurement of ventricular volume and ejection fraction under limited circumstances

MAJOR OUTCOMES CONSIDERED

Accuracy of tests and procedures

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases
Searches of Unpublished Data

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Databases searched included Medline and Cochrane. In addition, the guideline developers polled experts in specific areas for data.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Level A: Randomized, Controlled, Clinical Trials
May be assigned based on results of a single trial

Level B: Cohort and Case-Control Studies
Post hoc, subgroup analysis, and meta-analysis
Prospective observational studies or registries

Level C: Expert Opinion
Observational studies – epidemiologic findings
Safety reporting from large-scale use in practice

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The Heart Failure Society of America (HFSA) Guideline Committee sought resolution of difficult cases through consensus building. Written documents were essential to this process, because they provided the opportunity for feedback from all members of the group. On occasion, consensus of Committee opinion was

sufficient to override positive or negative results of almost any form or prior evidence.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

"Is recommended": Part of routine care
Exceptions to therapy should be minimized.

"Should be considered": Majority of patients should receive the intervention. Some discretion in application to individual patients should be allowed.

"May be considered": Individualization of therapy is indicated

"Is not recommended": Therapeutic intervention should not be used

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The process of moving from ideas of recommendations to a final document includes many stages of evaluation and approval. Every section, once written, had a lead reviewer and 2 additional reviewers. After a rewrite, each section was assigned to another review team, which led to a version reviewed by the Committee as a whole and then the Heart Failure Society of America (HFSA) Executive Council, representing 1 more level of expertise and experience. Out of this process emerged the final document.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The strength of evidence (A, B, C) and strength of recommendations are defined at the end of the "Major Recommendations" field.

Evaluation of Patients at Risk

- Evaluation with a routine history, physical examination, chest X-ray, and electrocardiogram (ECG) is recommended in patients with the medical conditions or test findings listed in Table 4.1, below. (Strength of Evidence = B)

Table 4.1: Indications for Evaluation of Patients at Risk for Heart Failure (HF)

Conditions	Hypertension Diabetes Obesity Coronary artery disease (e.g., after myocardial infarction [MI], revascularization) Peripheral arterial disease or cerebrovascular disease Valvular heart disease Family history of cardiomyopathy in a first-degree relative History of exposure to cardiac toxins Sleep-disordered breathing
Test Findings	Sustained arrhythmias Abnormal ECG (e.g., left ventricular hypertrophy [LVH], left bundle branch block, pathologic Q waves) Cardiomegaly on chest x-ray

- Assessment of Cardiac Structure and Function. Echocardiography with Doppler is recommended to determine left ventricular (LV) size and function in patients without signs or symptoms suggestive of HF who have the risk factors listed in Table 4.2, below. (Strength of Evidence = B)

Table 4.2: Risk Factors Indicating the Need to Assess Cardiac Structure and Function in Patients at Risk for HF

- Coronary artery disease (e.g., after myocardial infarction [MI], revascularization)
- Valvular heart disease
- Family history of cardiomyopathy in a first-degree relative
- Atrial fibrillation or flutter
- Electrocardiographic evidence of left ventricular hypertrophy (LVH), left bundle branch block, or pathologic Q waves
- Complex ventricular arrhythmia
- Cardiomegaly, S3 gallop, or potentially significant heart murmurs by physical examination

- Determination of plasma B-type natriuretic peptide (BNP) or N-terminal (NT) pro-BNP concentration is not recommended as a routine part of the evaluation for structural heart disease in patients at risk but without signs and symptoms of HF. (Strength of Evidence = B)

Evaluation of Patients Suspected of Having HF

- Symptoms Consistent with HF. The symptoms listed in Table 4.3, below, suggest the diagnosis of HF. It is recommended that each of these symptoms be solicited and graded in all patients in whom the diagnosis of HF is being considered. (Strength of Evidence = B)

Table 4.3: Symptoms Suggesting the Diagnosis of HF

Symptoms	Dyspnea at rest or on exertion Reduction in exercise capacity

	Orthopnea Paroxysmal nocturnal dyspnea (PND) or nocturnal cough Edema Ascites or scrotal edema
Less specific presentations of HF	Early satiety, nausea and vomiting, abdominal discomfort Wheezing or cough Unexplained fatigue Confusion/delirium

- Physical Examination. It is recommended that patients suspected of having HF undergo careful physical examination with determination of vital signs and be carefully evaluated for signs and symptoms shown in Table 4.4, below. (Strength of Evidence = C)

Table 4.4: Signs to Evaluate in Patients Suspected of Having HF

Cardiac Abnormality	Sign
Elevated cardiac filling pressures and fluid overload	Elevated jugular venous pressure S3 gallop Rales Hepatojugular reflux Ascites Edema
Cardiac enlargement	Laterally displaced or prominent apical impulse Murmurs suggesting valvular dysfunction

- It is recommended that BNP or NT-proBNP levels be assessed in all patients suspected of having HF when the diagnosis is not certain. (Strength of Evidence = B)
- Differential Diagnosis. The differential diagnoses in Table 4.5, below, should be considered as alternative explanations for signs and symptoms consistent with HF. (Strength of Evidence = C)

Table 4.5: Differential Diagnosis for HF Symptoms and Signs

• Myocardial ischemia • Pulmonary disease (pneumonia, asthma, chronic obstructive pulmonary disease, pulmonary embolus, primary pulmonary hypertension) • Sleep-disordered breathing • Obesity • Deconditioning • Malnutrition • Anemia • Hepatic failure • Renal failure • Hypoalbuminemia • Venous stasis

- Depression
- Anxiety and hyperventilation syndromes

Initial Evaluation of Patients with HF

- It is recommended that patients with a diagnosis of HF undergo evaluation as outlined in Table 4.6, below. (Strength of Evidence = C)

Table 4.6: Initial Evaluation of Patients with a Diagnosis of HF

- Assess clinical severity of HF by history and physical examination
- Assess cardiac structure and function
- Determine the etiology of HF
- Evaluate for coronary disease and myocardial ischemia
- Evaluate the risk of life-threatening arrhythmia
- Identify any exacerbating factors for HF
- Identify comorbidities which influence therapy
- Identify barriers to adherence and compliance

- Symptoms. In addition to symptoms characteristic of HF, the following symptoms should be considered in the diagnosis of HF:
    - Angina
    - Symptoms of possible cerebral hypoperfusion, including syncope, presyncope, or lightheadedness
    - Symptoms suggestive of embolic events
    - Symptoms suggestive of sleep-disordered breathing
- Functional Capacity/Activity Level. It is recommended that the severity of clinical disease and functional limitation be evaluated and recorded and the ability to perform typical daily activities be determined. This evaluation may be graded by metrics such as New York Heart Association (NYHA) functional class (Table 4.7 in the original guideline document) (Strength of Evidence = A) or by the 6-minute walk test. (Strength of Evidence = C)
- Volume Status. The degree of volume excess is a key consideration during treatment. It is recommended that it be routinely assessed by determining:
    - Presence of paroxysmal nocturnal dyspnea or orthopnea
    - Daily weights and vital signs with assessment for orthostatic changes
    - Presence and degree of rales, S3 gallop, jugular venous pressure elevation, positive hepatojugular reflux, edema, and ascites (Strength of Evidence = B)
- Standard Laboratory Tests. It is recommended that the following laboratory tests be obtained routinely in patients being evaluated for HF: serum electrolytes, blood urea nitrogen, creatinine, glucose, calcium, magnesium, lipid profile (low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, triglycerides), complete blood count, serum albumin, liver function tests, urinalysis, and thyroid function. (Strength of Evidence = B)
- ECG. It is recommended that all patients with HF have an ECG performed to:
    - Assess cardiac rhythm and conduction
    - Detect LV hypertrophy
    - Evaluate QRS duration, especially when ejection fraction < 35%

    - Detect evidence of myocardial infarction or ischemia (Strength of Evidence = B)
- Chest X-Ray. It is recommended that all patients with HF have a posteroanterior and lateral chest X-ray examination for determination of heart size, evidence of fluid overload, and detection of pulmonary and other diseases. (Strength of Evidence = B)
- Additional Laboratory Tests. It is recommended that patients with no apparent etiology of HF or no specific clinical features suggesting unusual etiologies undergo additional directed blood and laboratory studies to determine the cause of HF. (Strength of Evidence = C)
- Exercise testing is not recommended as part of routine evaluation in patients with HF. Specific circumstances in which maximal exercise testing with measurement of expired gases should be considered include:
    - Assessing disparity between symptomatic limitation and objective indicators of disease severity
    - Distinguishing non HF-related causes of functional limitation, specifically cardiac versus pulmonary
    - Considering candidacy for cardiac transplantation or mechanical intervention
    - Determining the prescription for cardiac rehabilitation
    - Addressing specific employment capabilities

  Exercise testing with physiologic testing for inducible abnormality in myocardial perfusion or wall motion abnormality should be considered to screen for the presence of coronary artery disease with inducible ischemia. (Strength of Evidence = C)

Common Errors in Initial Assessment

- Routine endomyocardial biopsy is not recommended in cases of new-onset HF. Endomyocardial biopsy should be considered in patients with rapidly progressive clinical HF or ventricular dysfunction, despite appropriate medical therapy. Endomyocardial biopsy also should be considered in patients suspected of having myocardial infiltrative processes, such as sarcoidosis or amyloidosis, or in patients with malignant arrhythmias out of proportion to LV dysfunction, where sarcoidosis and giant cell myocarditis are considerations. (Strength of Evidence = C)

Follow-up Evaluation

- It is recommended that clinical evaluation at each follow-up visit include determination of the elements listed in Table 4.9, below. (Strength of Evidence = B)

  These assessments should include the same symptoms and signs assessed during the initial evaluation. (Strength of Evidence = C)

Table 4.9: Elements to Determine at Follow-Up Visits of HF Patients

• Functional capacity and activity level • Changes in body weight

- Patient understanding of and compliance with dietary sodium restriction
- Patient understanding of and compliance with medical regimen
- History of arrhythmia, syncope, presyncope, or palpitation
- Compliance and response to therapeutic interventions
- The presence or absence of exacerbating factors for HF, including worsening ischemic heart disease, hypertension, and new or worsening valvular disease

- Routine reevaluation of cardiac function by noninvasive or invasive methods is not recommended. Repeat measurements of ventricular volume and ejection fraction (EF) should be considered under limited circumstances:
    - After at least 3 months of medical therapy when a prophylactic internal cardioverter defibrillator (ICD) placement is being considered in order to determine that EF criteria for internal cardioverter defibrillator placement are still met. (Strength of Evidence = B)
    - In patients who show substantial clinical improvement (for example, in response to beta-blocker treatment). Such change may denote improved prognosis, although it does not in itself mandate alteration or discontinuation of specific treatments (see Section 7 in the original guideline document). (Strength of Evidence = C)

  Repeat determination of EF is usually unnecessary in patients with previously documented LV dilatation and low EF who manifest worsening signs or symptoms of HF. Repeat measurement should be considered when it is likely to prompt a change in patient management, such as cardiac transplantation. (Strength of Evidence = C)

- It is recommended that reevaluation of electrolytes and renal function occur at least every 6 months in clinically stable patients and more frequently following changes in therapy or with evidence of change in volume status. More frequent assessment of electrolytes and renal function is recommended in patients with severe HF, those receiving high doses of diuretics, and those who are clinically unstable. (Strength of Evidence = C) See the National Guideline Clearinghouse (NGC) summary of the Heart Failure Society of American (HFSA) guideline Heart Failure in Patients with Left Ventricular Systolic Dysfunction for recommendations for patients on an angiotensin receptor blocker.

Definitions:

Strength of Evidence

Level A: Randomized, Controlled, Clinical Trials
May be assigned based on results of a single trial

Level B: Cohort and Case-Control Studies
Post hoc, subgroup analysis, and meta-analysis
Prospective observational studies or registries

Level C: Expert Opinion
Observational studies – epidemiologic findings
Safety reporting from large-scale use in practice

Strength of Recommendations

"Is recommended": Part of routine care
Exceptions to therapy should be minimized.

"Should be considered": Majority of patients should receive the intervention. Some discretion in application to individual patients should be allowed.

"May be considered": Individualization of therapy is indicated

"Is not recommended": Therapeutic intervention should not be used

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations").

The recommendations are supported by randomized controlled clinical trials, cohort and case-control studies, and expert opinion.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Accurate evaluation of ventricular dysfunction and heart failure

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

It must be recognized that the evidence supporting recommendations is based largely on population responses that may not always apply to individuals within the population. Therefore, data may support overall benefit of 1 treatment over another but cannot exclude that some individuals within the population may respond better to the other treatment. Thus guidelines can best serve as

evidence-based recommendations for management, not as mandates for management in every patient. Furthermore, it must be recognized that trial data on which recommendations are based have often been carried out with background therapy not comparable to therapy in current use. Therefore, physician decisions regarding the management of individual patients may not always precisely match the recommendations. A knowledgeable physician who integrates the guidelines with pharmacologic and physiologic insight and knowledge of the individual being treated should provide the best patient management.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Pocket Guide/Reference Cards
Slide Presentation

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Staying Healthy

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Heart Failure Society of America. Evaluation of patients for ventricular dysfunction and heart failure. J Card Fail 2006 Feb;12(1):e16-25. [33 references] PubMed

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1999 (revised 2006 Feb)

GUIDELINE DEVELOPER(S)

Heart Failure Society of America, Inc - Disease Specific Society

SOURCE(S) OF FUNDING

Heart Failure Society of America, Inc

GUIDELINE COMMITTEE

Comprehensive Heart Failure Practice Guideline Committee

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Committee members and reviewers from the Executive Council received no direct financial support from the Heart Failure Society of America (HFSA) or any other source for the development of the guideline. Administrative support was provided by the Heart Failure Society of America staff, and the writing of the document was performed on a volunteer basis by the Committee. Financial relationships that might represent conflicts of interest were collected for all members of the Guideline Committee and of the Executive Council, who were asked to disclose potential conflicts and recuse themselves from discussions when necessary. Current relationships are shown in Table 1.5 of the "Development and Implementation" companion document (see the "Availability of Companion Documents" field).

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Heart Failure Society of America. Heart Failure Society of America (HFSA) practice guidelines. HFSA guidelines for

management of patients with heart failure caused by left ventricular systolic dysfunction--pharmacological approaches. J Card Fail 1999 Dec;5(4):357-82.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Heart Failure Society of America, Inc. Web site.

Print copies: Available from the Heart Failure Society of America, Inc., Court International - Suite 240 S, 2550 University Avenue West, Saint Paul, Minnesota 55114; Phone: (651) 642-1633

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Heart Failure Society of America. Executive summary: HFSA 2006 comprehensive heart failure practice guideline. J Card Fail 2006 Feb;12(1):10-38.
- Heart Failure Society of America. Development and implementation of a comprehensive heart failure practice guideline. J Card Fail 2006 Feb;12(1):e3-9.
- Heart Failure Society of America. Conceptualization and working definition of heart failure. J Card Fail 2006 Feb;12(1):e10-11.

  Electronic copies: Available from the Heart Failure Society of America, Inc. Web site.

- PowerPoint slides. HFSA 2006 comprehensive heart failure guideline.

  Electronic copies: Available from the Heart Failure Society of America, Inc. Web site.

The following is also available:

- Heart Failure Society of America. Pocket guide. HFSA 2006 comprehensive heart failure practice guideline.

Electronic copies: Not available at this time.

Print copies: Available from the Heart Failure Society of America, Inc., Court International - Suite 240 South, 2550 University Avenue West, Saint Paul, Minnesota 55114; Phone: (651) 642-1633

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on July 31, 2006. The information was verified by the guideline developer on August 10, 2006.

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Date Modified: 10/6/2008


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